APPENDIX B

SAMPLE

OPERATION AND MAINTENANCE MANUAL

MULTIPURPOSE RECREATION FACILITY
MURPHY DOME, ALASKA

Prepared by
U.S. Army Corps of Engineers Alaska District Anchorage, Alaska

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(SAMPLE)

1. General. This Operation and Maintenance Manual for the Multipurpose Recreation facility at Murphy Dome has been prepared by the U.S. Army Engineer District, Alaska.

2. Purpose. The information contained in this manual describes the intended operation for which this facility was designed and is intended to guide operating personnel in the operation and maintenance of the facility.

3. Scope. This manual has four major divisions: (1) Architectural, (2) Structural, (3) Mechanical, and (4) Electrical. Each division will discuss the required operating system operations and other problems areas which are incorporated into the building design. Also covered will be precautionary procedures which must be maintained in order to obtain desired system operation.

4. Supplementary material. As-built drawings of the facility, manufacturers' catalog cuts, shop drawings and maintenance instructions on specific pieces of installed equipment are not included as a part of this example but should be for any manual prepared.

1 — ARCHITECTURAL

1-1. General. Common sense will provide good building maintenance, with special attention being given to the following:

a. Vapor barrier. Vapor barrier with sealed joints has been installed on ceiling and exterior walls between the insulation and interior finishes. All nail penetrations in the vapor barrier have been sealed with mastic during construction; thus theoretically a continuous vapor barrier is provided. The purpose of the vapor barrier is to prevent migration of moisture from inside the building into the insulation. If the insulation material gets wet and freezes, the insulation will be ineffective, and when the ambient temperature rises to about 32°F, water will drip into the building. Therefore, any damage to vapor barrier should be repaired before cold weather and the punching of holes through the vapor barrier should be avoided. If it is necessary to penetrate the vapor barrier, the hole must be sealed.

b. Exterior doors. All exterior doors, and particularly fire exit doors, should be kept free from an accumulation of drifting snow to prevent blockage. Melted snow freezes and causes the doors to become inoperative; therefore, periodic inspection of little used doors is recommended.

2 — STRUCTURAL

2-1. General. The building structure is of permanent noncombustible building materials. Therefore, no special maintenance is required. There are a few areas which may require minimal maintenance. These are as follows:

a. Eaves and overhangs. If sufficient glaciation occurs, water may enter the building by flowing under the roofing. If this happens, melt the ice dam (glacier) using heat which will not harm the building system. Condensed steam from continuous steam thawing may compound the problem caused by the water that has entered the building; therefore, caution should be exercised when using steam.

b. Drifting snow. Snow drifting against the building can cause problems when it melts. In some instances, the snowdrift acts as a dam holding water against the building wall. Drifting snow may also act as a bridge to the roof and subsequent drifting on the roof. Periodic removal of drifts from the exterior of the building will eliminate this problem.

2-2. Design loads. The design loads for the building are as follows:

Snow load is 30 pounds per square foot.

Wind load is 30 pounds per square foot.

Seismic zone is: Zone 3.

3 — MECHANICAL

3-1. General. Included are certain precautions which must be followed if the system is to operate as designed.

3-2. Heating.

a. System operation. The heat for the building is supplied from the central steam system. The building heat is supplied by passing air through the ventilation unit. The room thermostat controls a set face and bypass damper ahead of the steam coil which regulates the amount of air passing through the coil. A duct-mounted low limit discharge controller overrides the room thermostat when necessary to prevent delivery of air below 60°F. Steam to the coil is controlled by an automatic steam valve which opens or closes as the face and bypass dampers open or close. When all the air is bypassing the coil, the steam valve should be completely closed. In addition, an outdoor thermostat overrides the damper control to assure that the steam valve is 100 percent open when the outside temperature is below 35°F.

b. Precautions.

(1) If the outdoor thermostat to the steam control valve is set below 35°F, freezing of the steam coil may result.

(2) If the bypass damper does not close the steam valve when in the full bypass position, the building will overheat.

(3) When the low limit discharge control is set too low, uncomfortable cold drafts will result. If the low limit is set too high, the buildings will overheat.

3-3. Ventilation.

a. System operation. The heating and ventilating unit also provides building ventilation. Ventilation is required to provide building ventilation. Ventilation is required to provide a clean healthful atmosphere and to prevent accumulation of excess humidity. Ventilation is provided by mixing outside air with return in a mixing box. The mixing box dampers are controlled by a thermostat which maintains mixed air within the mixing box at a constant 42°F. Thus as the outside temperature rises, the percentage of outside air increases to maintain comfortable conditions in the building. An auxiliary thermostat overrides the mixing box control and shuts off all outside air whenever the return temperature falls below 68°F. Whenever outside air is introduced, an equal amount of room air must be exhausted to prevent excess pressure accumulation inside the building. This is accomplished by means of a relief damper located at the end of the gym. As the outside air damper opens, the relief damper opens the same amount.

b. Precautions.

(1) If the mixing box control is set below 42°F, the heating coil may lack the capacity to maintain the room temperature at 70°F.

(2) If the mixing box control is set above 42°F, the building will not be adequately ventilated and damage may result from excess accumulation of moisture. The excess moisture condenses on cold surfaces and "rain" occurs inside the building during certain weather conditions.

(3) If the override is set above 68°F, the building will not be properly ventilated and the same results noted in paragraph (2) above may occur.

3-4. Humidification.

a. System operation. During cold weather, outside air is very dry. When the outside air is brought into the building and warmed, its relative humidity drops to uncomfortable levels. To offset this, a steam humidifier is installed in the duct downstream of the heating and ventilating unit. A room humidistat controls an automatic valve in the steam supply line to the humidifier. The room humidistat should be set at 20 percent to 30 percent.

b. Precautions.

(1) If the humidistat is set above 30 percent, excess humidity will condense on the building walls with the undesirable results noted in paragraph 3-3.

(2) If the humidistat is set too low, the air will dry out, causing human discomfort and causing shrinkage of the wood floors of the gym and bowling alley.

(3) Whenever the heating and ventilating unit fan is stopped, the manual valve on the steam supply to the humidifier should be closed to prevent serious accumulations of water in the ductwork.

4 — ELECTRICAL

4-1. General. The electrical system consists of power and lighting system and a fire detection and alarm system.

4-2. Power system. The 480 volt, 3 phase, 60 hertz power to the building is supplied from a feeder which is tapped from Feeder F-15 inside the Operations Building through a 50 ampere, 600 volt circuit breaker. The feeder is routed through P-5 raceway to the Recreation, Multipurpose building. Inside the Recreation, Multipurpose building, the feeder branches, supplying the main building power through a 50 ampere, 600 volt circuit breaker and a 30 KVA, 420-120/208 volt, 3 phase dry type transformer. The other branch supplies the fire alarm and exit lights through a 20 ampere, 600 volt circuit breaker and a 250 VA, 480-120 volt single phase, dry type transformer.

a. Heating and ventilating. The power for the heating and ventilating unit is supplied from Panel "P". The control of the unit is described in the Mechanical Section.

b. Lighting. The power for the lighting power Panel “A” is supplied from Panel "P".

4-3. Fire detection and alarm system. The fire detection and alarm system consists of fixed temperature type detectors, alarm stations, alarm bells and a control unit. The system is connected to the base system. A local alarm will shut down all ventilating and exhaust fans through an interlocking relay.

4-4. Electrical system. The electrical system does not have any unusual maintenance requirements.